IN THE CLAIMS:

Please cancel claims 106 and 121 without prejudice or disclaimer and amend the claims as shown below. A clean copy of all the pending claims, after amendment, is attached as Appendix A.

1. (Previously cancelled)

2. (Previously amended) A method of detecting a nucleic acid target having at least two portions, said method comprising:

contacting the nucleic acid target with at least two types of nanoparticles having oligonucleotides attached thereto, the oligonucleotides on the first type of nanoparticles having a sequence complementary to a first portion of the sequence of the nucleic acid target, the oligonucleotides on the second type of nanoparticles having a sequence complementary to a second portion of the sequence of the nucleic acid target, the contacting taking place under conditions effective to allow hybridization of the oligonucleotides on the nanoparticles with the nucleic acid target, wherein in the presence of the nucleic acid target and under hybridization conditions, the nanoparticles having oligonucleotides bound thereto form a complex with the nucleic acid target, the resulting complex having a sharp melting profile and increased melting temperature relative to a comparable complex without nanoparticles, to allow for selective discrimination of any nucleotide insertion, deletion, or mismatch in the nucleic acid target; and

observing a detectable change brought about by hybridization of the oligonucleotides on the nanoparticles with the nucleic acid target.

3. (Original) The method of Claim 2 wherein the contacting conditions include freezing and thawing.

4. (Original) The method of Claim 2 wherein the contacting conditions include heating.

5. (Original) The method of Claim 2 wherein the detectable change is observed on a solid surface.

6. (Original) The method of Claim 2 wherein the detectable change is a color change observable with the naked eye.

7. (Original) The method of Claim 6 wherein the color change is observed on a solid surface.

8. (Original) The method of Claim 2 wherein the nanoparticles are made of gold.

9. (Previously amended) The method of Claim 2 wherein the oligonucleotides attached to the nanoparticles are labeled on their ends not attached to the nanoparticles with molecules that produce a detectable change upon hybridization of the oligonucleotides on the nanoparticles with the nucleic acid target.

10. (Original) The method of Claim 9 wherein the nanoparticles are metallic or semiconductor nanoparticles and the oligonucleotides attached to the nanoparticles are labeled with fluorescent molecules.

11. (Previously amended) The method of Claim 2 wherein:

the nucleic acid target has a third portion located between the first and second portions, and the sequences of the oligonucleotides on the nanoparticles do not include sequences complementary to this third portion of the nucleic acid target; and

the nucleic acid target is further contacted with a filler oligonucleotide having a sequence complementary to this third portion of the nucleic acid target, the contacting taking place under conditions effective to allow hybridization of the filler oligonucleotide with nucleic acid target.

12. (Previously amended) The method of Claim 2 wherein the nucleic acid target is viral RNA or DNA.

13. (Previously amended) The method of Claim 2 wherein the nucleic acid target is a gene associated with a disease.

14. (Previously amended) The method of Claim 2 wherein the nucleic acid target is a bacterial DNA.

15. (Previously amended) The method of Claim 2 wherein the nucleic acid target is a fungal DNA.

16. (Previously amended) The method of Claim 2 wherein the nucleic acid target is a synthetic DNA, a synthetic RNA, a structurally-modified natural or synthetic RNA, or a structurally-modified natural or synthetic DNA.

17. (Previously amended) The method of Claim 2 wherein the nucleic acid target is from a biological source.

18. (Previously amended) The method of Claim 2 wherein the nucleic acid target is a product of a polymerase chain reaction amplification.

19. (Previously amended) The method of Claim 2 wherein the nucleic acid target is contacted with the first and second types of nanoparticles simultaneously.

20. (Previously amended) The method of Claim 2 wherein the nucleic acid target is contacted and hybridized with the oligonucleotides on the first type of nanoparticles before being contacted with the second type of nanoparticles.

21. (Original) The method of Claim 20 wherein the first type of nanoparticles is attached to a substrate.

22. (Previously amended) The method of Claim 2 wherein the nucleic acid target is double-stranded and hybridization with the oligonucleotides on the nanoparticles results in the production of a triple-stranded complex.

23. (Previously amended) A method of detecting nucleic acid target having at least two portions comprising:

providing a substrate having a first type of nanoparticles attached thereto, the nanoparticles having oligonucleotides attached thereto, the oligonucleotides having a sequence complementary to a first portion of the sequence of the nucleic acid target;

contacting the nucleic acid target with the nanoparticles attached to the substrate under conditions effective to allow hybridization of the oligonucleotides on the second type of nanoparticles with the nucleic acid target;

providing a second type of nanoparticles having oligonucleotides attached thereto, the oligonucleotides having a sequence complementary to one or more other portions of the sequence of the nucleic acid target;

contacting the nucleic acid bound to the substrate with the second type of nanoparticles under conditions effective to allow hybridization of the oligonucleotides on the second type of nanoparticles with the nucleic acid target; and

observing a detectable change, wherein in the presence of the nucleic acid target and under hybridization conditions, the nanoparticles having oligonucleotides bound thereto form a complex with the nucleic acid target, the resulting complex having a sharp melting profile and increased melting temperature relative to a comparable complex without nanoparticles, to allow for selective discrimination of any nucleotide insertion, deletion, or mismatch in the nucleic acid target.

24. (Original) The method of Claim 23 wherein the nanoparticles are made of gold.

25-28. (Previously cancelled)

29. (Previously amended) A method of detecting a nucleic target acid having at least two portions, said method comprising:

contacting the nucleic acid target with a substrate having oligonucleotides attached thereto, the oligonucleotides having a sequence complementary to a first portion of the sequence of the nucleic acid target, the contacting taking place under conditions

effective to allow hybridization of the oligonucleotides on the substrate with the nucleic acid target;

contacting the nucleic acid target bound to the substrate with a first type of nanoparticles having oligonucleotides attached thereto, the oligonucleotides having a sequence complementary to one or more other portions of the sequence of the nucleic acid target, the contacting taking place under conditions effective to allow hybridization of the oligonucleotides on the nanoparticles with the nucleic acid target;

contacting the first type of nanoparticles bound to the substrate with a second type of nanoparticles having oligonucleotides attached thereto, the oligonucleotides on the second type of nanoparticles having a sequence complementary to at least a portion of the sequence of the oligonucleotides on the first type of nanoparticles, the contacting taking place under conditions effective to allow hybridization of the oligonucleotides on the first and second types of nanoparticles; and

observing a detectable change, wherein in the presence of the nucleic acid target and under hybridization conditions, the nanoparticles having oligonucleotides bound thereto form a complex with the nucleic acid target, the resulting complex having a sharp melting profile and increased melting temperature relative to a comparable complex without nanoparticles, to allow for selective discrimination of any nucleotide insertion, deletion, or mismatch in the nucleic acid target.

30. (Original) The method of Claim 29 wherein the substrate is transparent.

31. (Original) The method of Claim 30 wherein the detectable change is the formation of dark areas on the substrate.

32. (Original) The method of Claim 29 wherein the nanoparticles are made of gold.

33-41. (Previously cancelled)

42. (Presently twice amended) A method of detecting a nucleic acid target having at least two portions comprising:

providing a first type of metallic or semiconductor nanoparticles having oligonucleotides attached thereto, the oligonucleotides having a sequence complementary to a first portion of the sequence of the nucleic acid target and being labeled with a fluorescent molecule;

providing a second type of metallic or semiconductor nanoparticles having oligonucleotides attached thereto, the oligonucleotides having a sequence complementary to a second portion of the sequence of the nucleic acid target and being labeled with a fluorescent molecule;

contacting the nucleic acid target with the two types of nanoparticles under conditions effective to allow hybridization of the oligonucleotides on the two types of nanoparticles with the nucleic acid target, wherein in the presence of the nucleic acid target and under hybridization conditions, the nanoparticles having oligonucleotides bound thereto form a complex with the nucleic acid target, the resulting complex having a sharp melting profile and increased melting temperature relative to a comparable complex without nanoparticles, to allow for selective discrimination of any nucleotide insertion, deletion, or mismatch in the nucleic acid target; and

observing changes in fluorescence.

43. (Original) The method of Claim 42 further comprising placing a portion of the mixture of the nanoparticles and the nucleic acid target in an observation area located on a microporous material, treating the microporous material so as to remove any unbound nanoparticles from the observation area, and then observing the changes in fluorescence.

44-105. (Previously cancelled)

106. (Currently cancelled)

107. (Previously added) The method of claim 42 wherein the nucleic acid target is contacted and hybridized with the oligonucleotides on first type of nanoparticles before being contacted with the second type of nanoparticles.

108. (Previously added) The method of claim 42 wherein the nucleic acid target is contacted and hybridized with the oligonucleotides on second type of nanoparticles before being contacted with the first type of nanoparticles.

109. (Previously added) The method of claim 42 wherein the nucleic acid target is simultaneously contacted with the first and second types of nanoparticles.

110. (Previously added) The method of claim 42 wherein the fluorescent molecule bound to the oligonucleotides of the first type of nanoparticles is a donor and the fluorescent molecule bound to the oligonucleotides of the second type of nanoparticles is an acceptor.

112. (Previously added) The method of claim 42 wherein the fluorescent molecule bound to the oligonucleotides of the first type of nanoparticles is an acceptor and the fluorescent molecule bound to the oligonucleotides of the second type of nanoparticles is a donor.

113. (Currently amended) A method of detecting a nucleic acid target having one or more portions, said method comprising:

providing at least one type of metallic or semiconductor nanoparticles having oligonucleotides attached thereto, the oligonucleotides having a sequence complementary to at least one portion of the sequence of the nucleic acid target and being labeled with a fluorescent molecule;

contacting the nucleic acid target with at least one type of nanoparticles under conditions effective to allow hybridization of the oligonucleotides on the nanoparticles with the nucleic acid target, wherein in the presence of the nucleic acid target and under hybridization conditions, the nanoparticles having oligonucleotides bound thereto form a complex with the nucleic acid target, the resulting complex having a sharp melting profile and increased melting temperature relative to a comparable complex without nanoparticles, to allow for selective discrimination of any nucleotide insertion, deletion, or mismatch in the nucleic acid target; and

observing changes in fluorescence.

114. (Previously added) The method according to claim 113, further comprising providing a second type of metallic or semiconductor nanoparticles having oligonucleotides attached thereto, the oligonucleotides having a sequence complementary to at least one other portion of the sequence of the nucleic acid target and being labeled with a fluorescent molecule.

115. (Previously added) The method according to claim 114, further comprising contacting the nucleic acid target with the second type of nanoparticles under conditions effective to allow hybridization of the oligonucleotides on the nanoparticles with the nucleic acid target.

116. (Previously added) The method of claim 115 wherein the nucleic acid target is contacted and hybridized with the oligonucleotides on first type of nanoparticles before being contacted with the second type of nanoparticles.

117. (Previously added) The method of claim 115 wherein the nucleic acid target is contacted and hybridized with the oligonucleotides on second type of nanoparticles before being contacted with the first type of nanoparticles.

118. (Previously added) The method of claim 115 wherein the nucleic acid target is simultaneously contacted with the first and second types of nanoparticles.

119. (Previously added) The method of claim 115 wherein the fluorescent molecule bound to the oligonucleotides of the first type of nanoparticles is a donor and the fluorescent molecule bound to the oligonucleotides of the second type of nanoparticles is an acceptor.

120. (Previously added) The method of claim 115 wherein the fluorescent molecule bound to the oligonucleotides of the first type of nanoparticles is an acceptor and the fluorescent molecule bound to the oligonucleotides of the second type of nanoparticles is a donor.

121. (Currently cancelled)